EXPERIMENT- 7

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Branch: CSE **Section/Group:** 22BCS_IOT-639-A

Semester: 6 **Date of Performance:** 2.04.25

Subject Name: Project Based Learning in Java **Subject Code:**22CSH-359

EASYLEVEL

1. **Aim**: Create a Java program to connect to a MySQL database and fetch data from a single table.

2. **Objective:** To retrieve and display all records from a table named Employee with columns EmpID, Name, and Salary.

3. **Implementation/Code:**

```
package Project1; import java.sql.*; public
class Easy7JDBC { public static void main(String[]
args) {
        // Database connection details
        String url = "jdbc:mysql://localhost:3306/shivanidb";
        String username = "root";
        String password = "Shivani@1234";
        // SQL Query
String query = "SELECT * FROM Employee";    try (Connection conn =
DriverManager.getConnection(url, username, password);
             Statement stmt = conn.createStatement();
             ResultSet rs = stmt.executeQuery(query)) {
            System.out.println("Connected to shivanidb successfully!\n");
System.out.println("EmpID | Name | Salary");             while (rs.next())
{
                System.out.printf("%d | %s | %.2f\n",
rs.getInt("EmpID"), rs.getString("Name"), rs.getDouble("Salary"));}
        } catch (SQLException e) {
            System.err.println("Connection failed: " + e.getMessage());
        }
    }}
```

4. Output:

MEDIUMLEVEL

1. **Aim**: Build a program to perform CRUD operations

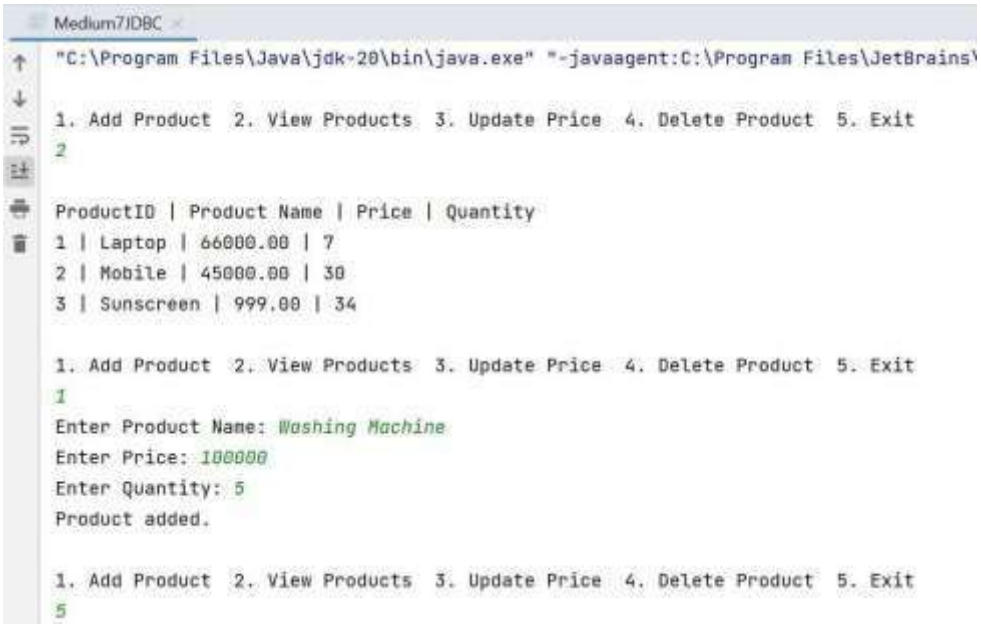
2. **Objective:** To perform Create, Read, Update, Delete on a database table Product with columns: ProductID, ProductName, Price, and Quantity. The program should include menu-driven options for each operation.

3. **Implementation/Code:**

```
  package Project1;       import
  java.sql.*;       import
java.util.Scanner; public class
Medium7JDBC { public static void
    main(String[] args) {
        String url = "jdbc:mysql://localhost:3306/shivanidb";
        String user = "root";
         String password = "Shivani@1234"; Scanner sc = new
Scanner(System.in); try (Connection conn =
DriverManager.getConnection(url, user, password)) {     while (true) {
                System.out.println("\n1. Add Product 2. View Products
3. Update Price 4. Delete Product 5. Exit");
int choice = sc.nextInt();      if (choice == 1) addProduct(conn, sc);
  else if (choice == 2) viewProducts(conn);       else if (choice == 3)
updateProduct(conn, sc);  else if (choice == 4) deleteProduct(conn, sc);
  else if (choice == 5)
break; else System.out.println("Invalid choice."); }
        } catch (SQLException e)
{ e.printStackTrace();}}  static void addProduct(Connection conn, Scanner
sc) throws
SQLException {
```

```
        System.out.print("Enter Product Name: ");
sc.nextLine();
        String name = sc.nextLine();
System.out.print("Enter Price: ");    double price =
sc.nextDouble();
System.out.print("Enter Quantity: "); int quantity =
sc.nextInt();
        PreparedStatement stmt = conn.prepareStatement("INSERT INTO
Product (ProductName, Price, Quantity) VALUES (?, ?, ?)");
stmt.setString(1, name); stmt.setDouble(2, price); stmt.setInt(3,
quantity);    stmt.executeUpdate();
        System.out.println("Product added.");
    }
    static void viewProducts(Connection conn) throws SQLException {
        ResultSet rs = conn.createStatement().executeQuery("SELECT * FROM
Product");
        System.out.println("\nProductID | Product Name | Price |
Quantity"); while
        (rs.next()) {
            System.out.printf("%d | %s | %.2f | %d\n", rs.getInt(1),
rs.getString(2), rs.getDouble(3), rs.getInt(4));
        }
   } static void updateProduct(Connection conn, Scanner sc)
    throws
SQLException {
        System.out.print("Enter ProductID to update: ");
int id = sc.nextInt();
        System.out.print("Enter new Price: "); double
price = sc.nextDouble();
        PreparedStatement stmt = conn.prepareStatement("UPDATE Product
SET Price=? WHERE ProductID=?"); stmt.setDouble(1, price); stmt.setInt(2,
id);    stmt.executeUpdate(); System.out.println("Product updated.");
    }
    static void deleteProduct(Connection conn, Scanner sc) throws
SQLException {
        System.out.print("Enter ProductID to delete: ");
int id = sc.nextInt();
        PreparedStatement stmt = conn.prepareStatement("DELETE FROM Product
WHERE ProductID=?"); stmt.setInt(1, id); stmt.executeUpdate();
        System.out.println("Product deleted.");
    }}
```

4. Output:



HARDLEVEL

1. **Aim**: Develop a Java application using JDBC and MVC architecture to manage student data.

2. **Objective:** To Use a Student class as the model with fields like StudentID, Name, Department, and Marks. Include a database table to store student data.

3. **Implementation/Code:**

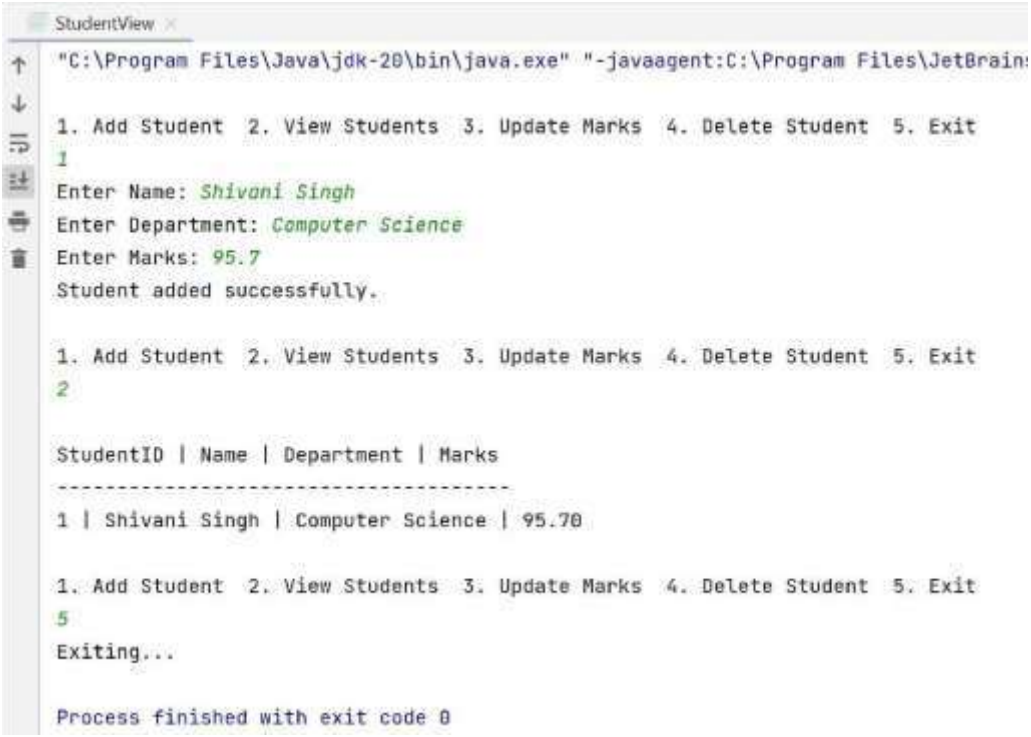
```
package Project1;
 import java.sql.SQLException;
import java.util.List; import
java.util.Scanner;

public class StudentView { public static void
main(String[] args) {     try {
            StudentController controller = new StudentController();
            Scanner sc = new Scanner(System.in);

            while (true) {
                 System.out.println("\n1. Add Student 2. View Students
```

```
3. Update Marks 4. Delete Student 5. Exit");
                int choice = sc.nextInt(); if
                (choice == 1) {
                    System.out.print("Enter Name: ");
sc.nextLine();
                    String name = sc.nextLine();
                    System.out.print("Enter Department: ");
                    String dept = sc.nextLine();
System.out.print("Enter Marks: ");    double marks = sc.nextDouble();
controller.addStudent(new
Studentss(0, name, dept, marks));     } else if (choice
               == 2) {
                    List<Studentss> students = controller.getStudents();
                    System.out.println("\nStudentID | Name | Department |
Marks");
                    System.out.println("---------------------------------
-----"); for (Studentss s : students) {
                        System.out.printf("%d | %s | %s | %.2f\n",
s.getStudentID(), s.getName(), s.getDepartment(), s.getMarks());
                    }
                } else if (choice == 3)
                {
                    System.out.print("Enter StudentID to update: ");
int id = sc.nextInt();
                    System.out.print("Enter new Marks: ");
double marks = sc.nextDouble();
controller.updateStudentMarks(id, marks);
                }
                else if (choice == 4) {
                    System.out.print("Enter StudentID to delete: ");
int id = sc.nextInt();                    controller.deleteStudent(id);
                }
                else if (choice == 5) {
                    System.out.println("Exiting...");
break;                  }                else {
                    System.out.println("Invalid choice.");
                }
            }
        } catch (SQLException e) {
            e.printStackTrace();
        }
    }
}
```

4. Output:



5. Learning Outcomes:

(i) Learn how to **establish a connection** between a Java application and a MySQL database using **JDBC**.

(ii) Understand the use of **DriverManager and Connection objects** to interact with the database.

(iii) Learn to use **PreparedStatement** to securely execute SQL queries.